

# NOAA SECTORAL APPLICATIONS RESEARCH PROGRAM (SARP)

## PROJECT ANNUAL REPORT

### PROJECT TITLE

A climate information system to enhance drought preparedness by underserved farmers in the Southeastern U.S.

### INVESTIGATORS

*(Research team and full contact information)*

**Gerrit Hoogenboom**, Professor & Coordinator of Research, Extension and Instruction University of Georgia, Department of Biological and Agricultural Engineering, Griffin, GA 30223-1797, phone number: (770) 228-7216, fax: (770) 228.7218, email: gerrit@uga.edu

**Carla Roncoli**, Associate Research Scientist University of Georgia, Department of Biological and Agricultural Engineering, Griffin, GA 30223-1797, phone number: (770) 228-7216, fax: (770) 228.7218, email: croncoli@uga.edu

**Carrie Furman**, Post-Doctoral Research Associate University of Georgia, Department of Biological and Agricultural Engineering, Griffin, GA 30223-1797, phone number: (770) 228-7216, fax: (770) 228.7218, email: cfurman@uga.edu

**Heather Gray**, Director of Communication Federation of Southern Cooperatives/Land Assistance Fund, 2769 Church Street East Point, GA 30344, phone number: (404) 765-0991, fax: (404) 765-9178, email: heathergray@federation.coop

**Mark Latimore, Jr.**, Interim Dean, College of Agriculture, Home Economics and Allied Programs Fort Valley State University, College of Agriculture, 1005 State University Drive Fort Valley GA 31030-4313, phone number: (478) 825-6327, email: latimorm@fvsu.edu

**NOAA GRANT NUMBER NA09OAR4310147**

**PROJECT YEARS**      **2009-2011 (2 YEARS)**

**TIME PERIOD ADDRESSED BY REPORT** *(e.g., August 2002-March 2003)*  
July 1, 2009- June 30, 2011

### I. PRELIMINARY MATERIALS

#### A Project Abstract *(Limit to one page)*

The southeastern U.S. has experienced severe droughts during the last decade, which have resulted in significant losses in agriculture and restrictions to water use. These droughts have been devastating to farmers, but especially those without irrigation. They include many minority farmers who have been less able to invest in irrigation because of lack of financial resources (including the inability to obtain loans because of racial discrimination) and are rarely reached by conventional extension services because of the small-scale, part-time, diversified nature of their operations. Yet, no research has been conducted on their specific vulnerabilities, their risk management strategies,

and on their needs and capabilities with respect to drought preparedness and mitigation. In particular, we seek to investigate whether and how minority farmers can take advantage of the recent advances in climate sciences that allow the forecasting of climate variability in the southeastern U.S. and elsewhere in the world, based on the El Nino Southern Oscillation (ENSO). Scientists from the Southeast Climate Consortium (SECC), one of the Regional Integrated Science and Assessment programs funded by NOAA's Climate Program Office, combine these seasonal forecasts with crop modeling to develop information products and tools that are disseminated to farmers through various means (website, extension, exhibits, press releases, etc.). However, these outreach efforts rarely reach African American farmers.

This project aims to develop a weather and climate information system to foster drought preparedness among African American farmers in the southeastern U.S., but also customizable and transferable to other underserved populations across the U.S. The proposed system will be informed by values of relevance, salience, credibility, and legitimacy and centered on the role of "boundary" organizations. Relevance and salience will be addressed by a mixed-method, multi-scalar approach to elicit quantitative and qualitative data through farmer workshops, focus groups, semi-structured interviews, and surveys. To foster legitimacy and credibility, our project builds on a partnership with representative institutions, namely a Historically Black University and a civil right organization comprised of farmers' cooperatives. The research will involve two phases. Phase 1 will investigate existing knowledge and practices whereby African American farmers manage climate risk, including access to and use of weather and climate information, and the parameters whereby they assess drought severity and impacts. Phase 2 will consist of efforts to design and test information tools and dissemination mechanisms adapted to their needs and capabilities. This project will support NIDIS by providing baseline data on a particularly vulnerable population, by developing and testing customized tools for minority farmers, by analyzing the role of boundary organizations in climate services, and by providing tools and guidelines for greater inclusion of underserved groups in drought preparedness and mitigation.

#### B Objective of Research Project (*Limit to one paragraph*)

The overall goal of this project is to promote drought preparedness and mitigation among underserved communities by establishing a weather and climate information system that specifically addresses their needs and capabilities.

Objective 1: Characterize the specific vulnerabilities of minority farmers to drought and the range of adaptive capabilities and options available to them.

Objective 2: Identify the weather and climate information needs of minority farmers and the key entry points in their management decisions, with particular emphasis on drought mitigation

Objective 3: Understand the ways minority farmers access and process weather and climate information in anticipating drought and mitigating its impacts

Objective 4: Develop and/or modify drought preparedness tools that are customized for the needs and capabilities of minority farmers and transferable to other underserved users

Objective 5: Design and assess communication and dissemination mechanisms to deliver relevant and timely drought information to minority farmers

Objective 6: Formulate guidelines to promote a greater involvement of underserved users in drought preparedness and mitigation across the U.S.

#### C Approach (including methodological framework, models used, theory developed and tested, project monitoring and evaluation criteria) include a description of the key beneficiaries of the anticipated findings of this project (e.g., decision makers in a particular

sector/level of government, researchers, private sector, science and resource management agencies) (*Limit to one page*)

**Approach:** The research will involve two phases. Phase 1 will prioritize research to investigate existing knowledge and practices whereby African American farmers manage climate risk, including use of weather and climate information, and the parameters whereby they assess drought severity and impacts. The analysis of these data will point to existing limitations in farmers' repertoire of adaptive strategies and access to technical advice and expert knowledge, while also providing us with information on entry points for disseminating weather and climate information. Phase 2 will focus on designing and testing a climate information system customized to the specific needs and capabilities of African American farmers (and transferable to other underserved populations). Different communication mechanisms will be tested and compared, such as printed materials, radio announcements, and cellular text messages. Key nodes of social interaction, such as churches, farmers' markets, seed/feed stores, equipment repair workshops, and community events, will also be used as points of information dissemination. Interactive sessions for farmers and intermediaries (extension agents, technical specialists, cooperative leaders, etc.) will provide opportunities for eliciting feedback on tools produced by NIDIS, SECC, and other climate application projects. This mixed-method, multi-scalar approach will ensure representativeness and triangulation of findings. Data will be analyzed will be analyzed using qualitative analysis software (NVIVO) and appropriate statistical tests will be performed using SPSS. Below we provide an outline of the research design and methods that will be deployed over the two-year research project.

**Beneficiaries:** This project specifically targets minority African American farmers living in the Southeastern US. The methods employed will be applicable to serve other minority groups across the US. African American farmers make up a significant share of many rural communities in the southern U.S. Texas, Mississippi, Alabama, and Georgia together account for more than half of all African American farm operators. Yet African American farmers and the communities they belong to are under increasing pressure from multiple stresses, including loss of land due to indebtedness and urbanization, the effects of globalization on markets and prices, in addition to persistent poverty and low education levels. All of these factors have contributed to a marked decrease in the number of African American family farmers and the size of their holdings. Citing the 2002 NASS census, the FSC/LAF states that African American farmland ownership has declined from over 100,000 farmers owning 8 million acres in 1960, to less than 30,000 farmers owning 3.4 million acres in 2002. African American owned farmland is also in jeopardy because many of these farmers do not have access to irrigation, which makes them extremely vulnerable to drought and therefore devastating crop losses.

D Description of any matching funds/activities used in this project (*Limit to one paragraph*)

Funding is leveraged with additional funding that is provided through the Southeast Climate Consortium in collaboration with the University of Florida, Florida State University, University of Miami, University of Alabama-Huntsville, Auburn University, and North Carolina State University. Funding is also leveraged through the University of Georgia and state and federal allocation of funds towards the salary of the principal investigator.

## II. ACCOMPLISHMENTS

- A. Brief discussion of project timeline and tasks accomplished. Include a discussion of data collected, models developed or augmented, fieldwork undertaken, or analysis and/or evaluation undertaken, workshops held, training or other capacity building activities implemented. *(This can be submitted in bullet form – limit to two pages)*

### **The proposed project timeline:**

**Institutional Assessment:** proposed for August and September 2009- In progress

**Phone Survey:** November 2009- A questionnaire was developed and a phone survey implemented with 100 minority farmers living in the southeast US. Participants were recruited through Federation of Southern Cooperatives' phone list. The Brisbane Institute at Morehouse College ([www.morehouse.edu/centers/brisbane/index.html](http://www.morehouse.edu/centers/brisbane/index.html)) assisted with the survey. College students conducted the phone interviews. Basic statistical results are available and undergoing further analysis.

**In-depth Interviews with farmers and coop leaders:** proposed for December 2009 to March 2010- Presently being organized in collaboration with the Federation of Southern Cooperatives' Field Office in Albany GA.

**Stakeholder workshops:** Proposed for January and February 2010- postponed after consultation with research partners to enable integration of stakeholders' needs and concerns elicited during interviews into workshop planning. However, a related SECC workshop on southeast agriculture and climate change in the southeast US is being held on April 12, 2010 in Camilla GA and will include participants from the Federation of Southern Cooperatives. This workshop will enable us to develop and test presentation and facilitation approaches to implement during the minority farmer workshops.

**Design/Test Delivery Mechanisms:** April-June 2010 and Oct-Dec 2010- Postponed (see above).

**Tool Development:** July-September 2010

**Report and Articles:** April and May 2011

- B. Summary of findings, including their potential or actual implications for efforts to develop applications, methods, and science-based decision support capacity/systems and to foster

### **Key Findings from Phone survey**

We found that:

- 79% of those surveyed live in an area affected by the 2008 drought.
- 65% of those surveyed suffered losses due to that drought.
- 77% of survey participants did not have irrigation, and
- 72% did not have crop insurance.
- 69% always refer to weather forecasts before making planting decisions.
- 49% always refer to climate forecasts before making planting decisions.

The farmers surveyed primarily use just a few of sources to attain weather information.

- 37% get their weather information from the Television.

C. List of any reports, papers, publications or presentations arising from this project; please send any reprints of journal articles as they appear in the literature. Indicate whether a paper is formally reviewed and published. *(No text limit)*

**Papers Presented:**

- “Communicating with underserved groups” a paper presented at the Southeast Climate Consortium Annual Meeting May 5-7, 2009, Griffin GA
- “Helping underserved farmers manage drought” a paper presented at the Federation of Southern Cooperatives annual meeting in Albany GA, February 12 and 13, 2010

D. Discussion of any significant deviations from proposed workplan (e.g., shift in priorities following consultation with program manager, delayed fieldwork, obstacles encountered during the course of the project that have impacted outcome delivery). *(Limit to one paragraph)*

This project experienced a delay in fieldwork due to the following unexpected events.

- 1) Delayed disbursement of funds
- 2) Departure of UGA PI Dr. Roncoli (now at Emory University) and replacement with Dr. Hoogenboom. However, Dr. Roncoli will remain closely involved with the research.
- 3) Departure of Dr. Joel Paz, SECC Agro-Met Extension Specialist (now at Mississippi State University): hiring of replacement is underway.
- 4) Retirement of FVSU PI, Dr. Harris and his replacement with new PI (Dr. Latimore).
- 5) The need to proceed slowly and build trust in stakeholder community through outreach events and constant consultation with partner institutions

E. Where appropriate, describe the climate information products and forecasts considered in your project (both NOAA and non-NOAA); identify any specific feedback on the NOAA products that might be helpful for improvement. *(bulleted response)*

- We provide the El Nino forecast during the Albany and Fort Valley outreach events.
- Facts sheets on climate change in SE US were also distributed at these events.

**III. GRAPHICS: PLEASE INCLUDE THE FOLLOWING GRAPHICS AS ATTACHMENTS TO YOUR REPORT**

A. One Power point slide depicting the overall project framework/approach/results to date

B. If appropriate, additional graphic(s) or presentation(s) depicting any key research results thus far- (see map below)

C. Photographs (if easy to obtain) from fieldwork to depict study information (if applicable). (see PowerPoint slide)

**IV. WEBSITE ADDRESS FOR FURTHER INFORMATION (IF APPLICABLE)**

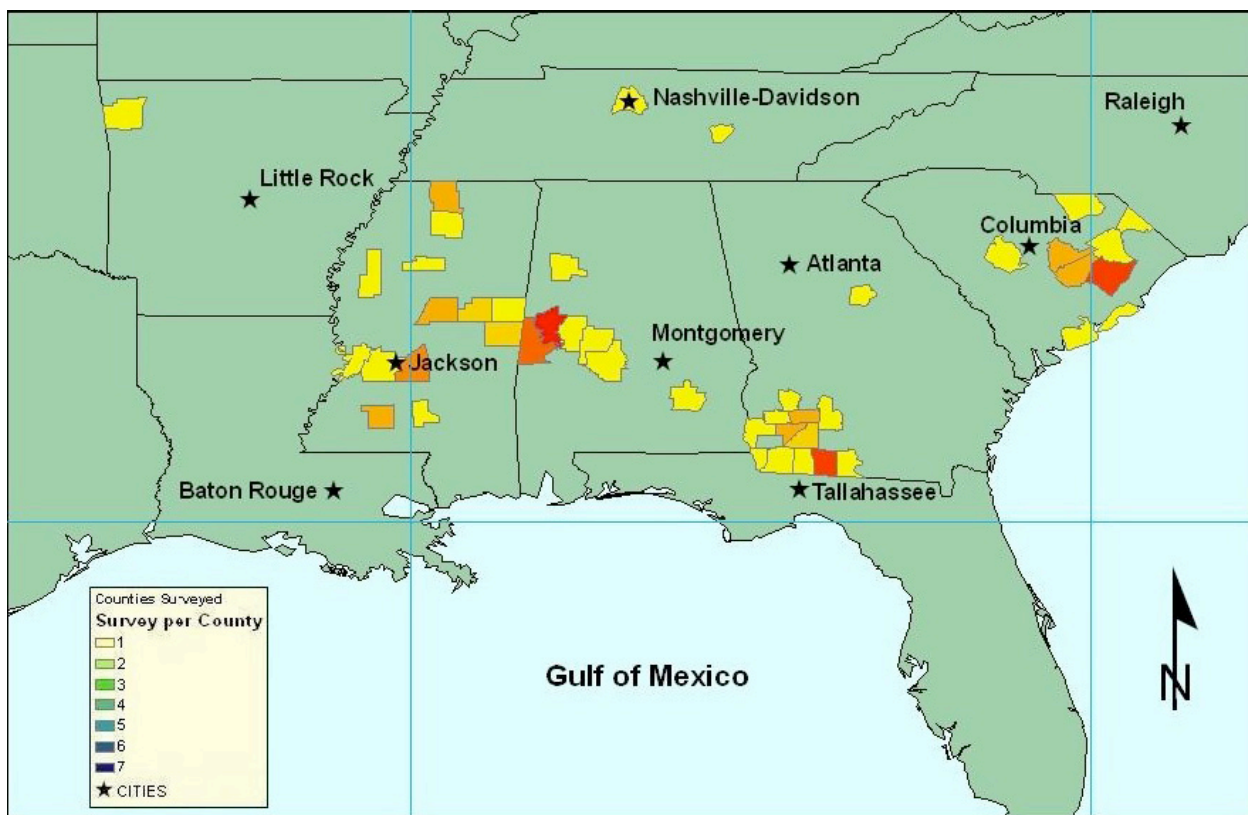
[www.SEClimate.org](http://www.SEClimate.org)

**V. ADDITIONAL RELEVANT INFORMATION NOT COVERED UNDER THE ABOVE CATEGORIES.**

**Outreach:**

**We have participated in and exhibited at the following conferences.**

- Federation of Southern Cooperatives, Annual Conference, Birmingham and Epes AL, August 14-16, 2009.
- Fort Valley State University Farm, Home and Ministers Conference, Fort Valley GA, February 9, 2010.
- Federation of Southern Cooperatives Annual Meeting, Albany GA, February 12-13, 2010



Preliminary GIS map showing number of phone survey respondents and their farm locations